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November 3, 1988

Mr. Scott Gardner
CERCLA PA/SI Regional Project Officer
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: Preliminary Assessment (2)
Brown's Plating Service
Paducah, Kentucky
EPA ID# KYD024143711

Dear Mr. Gardner:

Submitted for your review is the Preliminary Assessment (2) of the Brown's Plating Service site which is located just south of Paducah, in McCracken County, Kentucky. The information provided in this assessment is based upon a site visit, water user survey, published geologic and hydrologic reports, and a file review. The results of this investigation indicate that:

1. Hazardous wastes generated at this facility since the plating operations began in 1969 are sludge and wastewater with elevated levels of cyanide, zinc, chromium and nickel. Approximately 800 pounds of this waste was generated annually between 1969 and 1986.

2. Wastewater generated by the facility was treated on-site by a wastewater treatment system and then discharged to a nearby lagoon until 1986. Sludge/sediment from the lagoon was landspread on a nearby soybean field on property also owned by Mr. Brown until 1979. The wastewater lagoon was closed out in 1986. Since then wastewater has been recycled and disposed of at a permitted facility when no longer usable.

3. Although not verified by this assessment, Mr. Brown indicated that all plating sludge generated since operations began in the early 1970's has been disposed of off-site at the McCracken County landfill until 1979, and later at LWD, Incorporated and Trilcil Environmental, Incorporated, both permitted hazardous waste disposal facilities.

4. A water user survey indicates that there are no groundwater users within one mile of the facility, and less than 100 households between one and three miles from the site obtain their domestic water from wells. An apartment complex located approximately 3.5 miles from the site supplies 308 people with water from wells. There are no surface water intakes within 15 miles downstream from the facility.

5. There is no storage of material which might result in hazardous emissions and no known on-site problem associated with the site. There are no sensitive environments within three miles of the site.

Based upon the results of this Preliminary Assessment, it is recommended that a Site Screening Investigation with medium priority be undertaken at the Brown's Plating Service facility in order to assess the environmental impact of sediment in the lagoon area, as well as bottom sediment/sludge which was landspread nearby.

Sincerely,

Carl Millanti, Manager
Uncontrolled Sites Branch

CM/JC/lc

Enclosure

cc: Field Office
Joan Cullen-Lollis
Central File

PRELIMINARY ASSESSMENT (2)

BROWN'S PLATING SERVICE

PADUCAH, KENTUCKY

BY

JOAN CULLEN-LOLLIS

ABANDONED HAZARDOUS WASTE SITES SECTION

UNCONTROLLED SITES BRANCH

OCTOBER , 1988

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APPENDICES

INTRODUCTION

The Brown's Plating Service site is located on Kreb's Station Road in McCracken County, approximately five miles south of Paducah. Figure 1 shows the site location on the northwest 1/4 of the Melber topographic map at latitude 36° 59' 30" and longitude 088° 39' 20" (Appendix A). The facility is on the south side of a dissected ridge between Champion Creek and Blizzard Pond Drainage Canal. An unnamed creek at the southern part of the property drains into the Blizzard Pond Drainage Canal which eventually discharges into Clarks River approximately six miles to the east. Figure 2 (Appendix A) is a more detailed site map with various buildings and their use.

The information provided in this study is based upon published geologic and hydrologic data, a comprehensive file review, water user survey and site visit on September 21, 1988. Photographs which are referenced in the report are provided in Appendix C.

SITE HISTORY

Brown's Plating Service is a small family owned and operated business which has been located on-site since 1969. Primary operations at the facility are the zinc, nickel, chrome and gold plating of motorcycle parts which began in the early 1970's. Hazardous wastes which are generated by these processes are plating sludge and wastewater with elevated levels of cyanide (prior to 1973), chromium, nickel and zinc.

The facility filed a Part A Application in 1980. The information provided in the application at that time indicated that the facility generated annually approximately 200 pounds of nickel sludge, 500 pounds of chrome sludge and 100 pounds of cyanide liquid waste (Appendix B). This quantity of generated waste qualified the facility as a small generator until 1985 when production was increased to 60 pounds a month and Mr. Brown decided to register as a Full Quantity Generator (Appendix B). The site withdrew its Part A application in 1982.

Figure 3 (Appendix A) shows a flow and process diagram which was applicable to the facility prior to 1985, prepared by Brown's Plating Service. As can be seen from Figure 3, all plating wastes which were generated were treated and neutralized by the wastewater treatment system which was installed in 1972. This took place in Building #9 (see Figure 2). Photographs C-1 and C-2 (Appendix C) show the control panel for the rectifiers and two naturalization tanks. The Parkson Clarifier which was used is shown in Photograph C-3, with two round, brown tanks on either side which are the filters. A Fenton Dryer, shown in Photograph C-4 was used to dry the sludge, reducing approximately four 55-gallon drums of sludge to one 55-gallon drum. The resulting waste was then stored in drums similar to those in Photograph C-5, which were later picked up and disposed as hazardous waste at a permitted facility nearby (LWD, Incorporated or Tricil Environmental, Incorporated). Although not verified during this investigation, Mr. Brown indicated that all sludge wastes have always been disposed of off-site.

Wastewater from the treatment process was filtered and discharged to a 250,000 gallon lagoon adjacent to the building. Prior to 1979 sludge from the bottom of the lagoon was apparently landspread on a soybean field on nearby property also owned by

Mr. Brown. No analysis of this sludge was obtained, but the high chrome and zinc concentrations generally found in plating wastes suggest that material landspread was probably hazardous. Sample analysis of wastewater treatment sludge taken in 1986 are provided in Appendix E, and show slightly elevated levels of chromium and nickel.

Between 1981 and 1986, the site had a No Discharge Certification which required that no discharges occur from the lagoon. Water in the lagoon was periodically treated with lime to maintain a proper pH. In 1986, Mr. Brown applied for a KPDES permit for the facility (Appendix D). Analysis submitted as part of this permit application indicated that wastewater had nickel and zinc concentrations of 0.92 and 0.11 ppm, respectively. Also present in the wastewater was 1.75 ppm methylene chloride which is generally used as a degreaser. Strict effluent limits were set because of low flow conditions at the site and Mr. Brown decided in 1986 to close out the lagoon and eliminate potential environmental problems which would always be associated with discharges of wastewater from the facility.

The facility now recycles wastewater which significantly reduces the quantity generated. When wastewater can no longer be used it is discharged via PVC pipe to the former wastewater treatment building where it is stored in several large storage tanks. Photographs C-6 and C-7 show the storage area and tanks where wastewater is stored prior to being pumped out and disposed off-site.

Photographs C-8 and C-9 (Appendix C) show the former lagoon area where most surface runoff on the site drains to. The lagoon has two release valves which can be closed in the event of a serious spill. Analysis of a sediment sample and wastewater sample taken prior to closure of the lagoon is provided in Appendix E. Nickel concentrations are not known at this time, however, sampling by the Division of Waste Management indicated nickel concentrations of 8.8 mg/l in wastewater discharged to the lagoon (Appendix E). Brown's Plating Service now has authorization to operate a No Discharge Waste Treatment System, effective November 1987 to November 1992.

ENVIRONMENTAL SETTING

The Brown's Plating Service facility is located within the Jackson Purchase physiographic region of Kentucky in the westernmost part of the state. The topography is typically characterized by nearly level plains and slightly dissected uplands.

The site itself is located in the gently rolling uplands/dissected ridge area just south of Paducah. Photographs C-10, C-11, and C-12 (Appendix C) show the nearly level ridgetop topography where the facility is located. Construction is presently ongoing at the site for a 500,00 gallon lagoon which will hold water for fire protection. The slopes on the south side of the ridge are gently sloping with an average slope of 8%. Surface runoff eventually drains into Blizzard Pond Drainage Canal via an intermittent unnamed tributary.

The primary soil types at the site are the silt loams of the Memphis Series. These are generally deep, well drained soils which formed in the loess which is found on the ridgetops. Permeability of this soil ranges from 0.6 to 2.0 inches per hour (Humphrey, 1976).

The geologic units underlying the site vary considerably. Alluvium is present along tributaries of Blizzard Ponds Drainage Canal on the south side of the property. A mantle of loess, less than ten feet thick covers the uppermost level area of the ridge and overlies Pliocene or Pleistocene continental deposits characterized by reddish brown clayey to sandy gravel (Davis et. al., 1973, and Swanson, 1970). Figure 4 (Appendix A) shows the general lithologic characteristics of geologic units under the site, modified from Davis (1973). Although there is no site specific geologic data for the site (i.e. soil borings), the geologic map of the Melber Quadrangle (Swanson, 1970) indicates that the loess mantle overlies Pliocene or Pleistocene deposits which are approximately 40 feet thick. The Clairbourne Formation varies significantly in thickness over the quadrangle and may be absent altogether under the site. Only the upper part of the Wilcox Formation is exposed on the hillside near the site, but generally the Wilcox is greater than 100 feet thick in this region of Kentucky.

The region has a mild temperate humid continental type climate. Average rainfall is approximately 44.5 inches and is fairly well distributed throughout the year. Except in times of very heavy rainfall, much of the water will seep into the ground. This water will move rapidly downward through sand and gravel beds to the water table. Water level contours (Davis, 1967) indicate that the water table is at an approximate elevation of 380 to 390 feet MSL or between 40 to 50 feet below ground elevation.

The prevailing wind direction is from the south to southwest with windspeeds averaging 6 to 8 miles per hour from May to October and from 9 to 11 miles per hour from November to April (Humphrey, 1976).

The hydrologic characteristics of different units underlying the site are described in Figure 5 which has been modified from the Davis (1983). As can be seen, the primary water yielding zones of saturation are the sands in the Clairbourne Formation of Eocene age which can yield up to 300 gpm. Several clays are also present which may inhibit downward movement of water and result in perched water tables. Water quality is generally good with iron concentrations usually less than 0.3 mg/l and a pH of 6.9.

TARGET ANALYSIS

A Water User Survey was made of households within a four mile radius of Brown's Plating Service in order to estimate the number of households which could potentially be impacted in the event of contaminant migration from the site. Sands and gravel beds under the site, in particular, are vulnerable to downward migration of contaminants, with the potential to impact groundwater sources off-site, via the groundwater route.

Three public water utilities serve households within a four mile radius of the site. The distribution lines for each of these systems are mapped on the water user survey maps in Appendix F. The primary intake for these utilities is located approximately 30 miles downstream, on the Ohio River, on the northwest side of Paducah. The Paducah Water Works supplies water to the Lone Oak and the Hendron Water Districts.

Brown's Plating Service itself is within and is supplied by the Hendron Water District. A population of approximately 5,781 people are served by the Hendron system. The survey indicated that there were no groundwater users within one mile of the site. There are, however, several areas which still obtain their domestic water from wells within a two to four mile radius of the site. Approximately 87 households located in a small section of Highway 1014 just southeast of the site, along Geibe Road east of the site, and a section of Highway 348, southeast of Freemont, still rely on wells for their domestic water. In addition, an apartment complex located within the Lone Oak Water District, 3.5 miles northwest of the site also obtain their water from a well/wells. Approximately 308 people are served by groundwater at this apartment complex. A total of 637 people within a two to four mile radius of the site are groundwater users who could potentially be impacted in the event that contaminants are released at the site and migrate from the site via the groundwater route.

The potential for migration via the surface water pathway is minimal. The nearest surface water is an intermittent stream just over 1000 feet from the facility and most of the storm runoff at the site will collect in the former lagoon prior to being discharged tot he stream.

There are no known surface water intakes within 15 miles downstream from the site and therefore no households served by surface water. Some recreational use may be made of the Blizzard Drainage Canal approximately 0.75 miles from the site.

There area no known sensitive environments within three miles of Brown's Plating Service. Appendix G lists the six species which are endangered, threatened or of special concern found approximately 3.5 to four miles from the site (Kentucky Nature Preserve Commission, 1988).

There is no open storage of hazardous material which could result in hazardous releases to the environment via the air route. There is no known instance in which contact with hazardous substances at the facility has caused injury, illness, or death to humans or domestic or wild animals. The management practices of the facility (i.e., off-site disposal of all hazardous waste) suggest that there is minimal potential for injury by direct contact with hazardous substances at the facility. In addition, there is relatively limited access to the site by fences and gates which remain locked or are monitored during operational hours, with no schools or day-care centers near the site.

REFERENCES

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Swanson, R.W., 1970, Geologic Map of the Melber Quadrangle, Graves and McCracken Counties, Kentucky: U.S. Geol. Survey Geologic Quadrangle Map GQ-860.

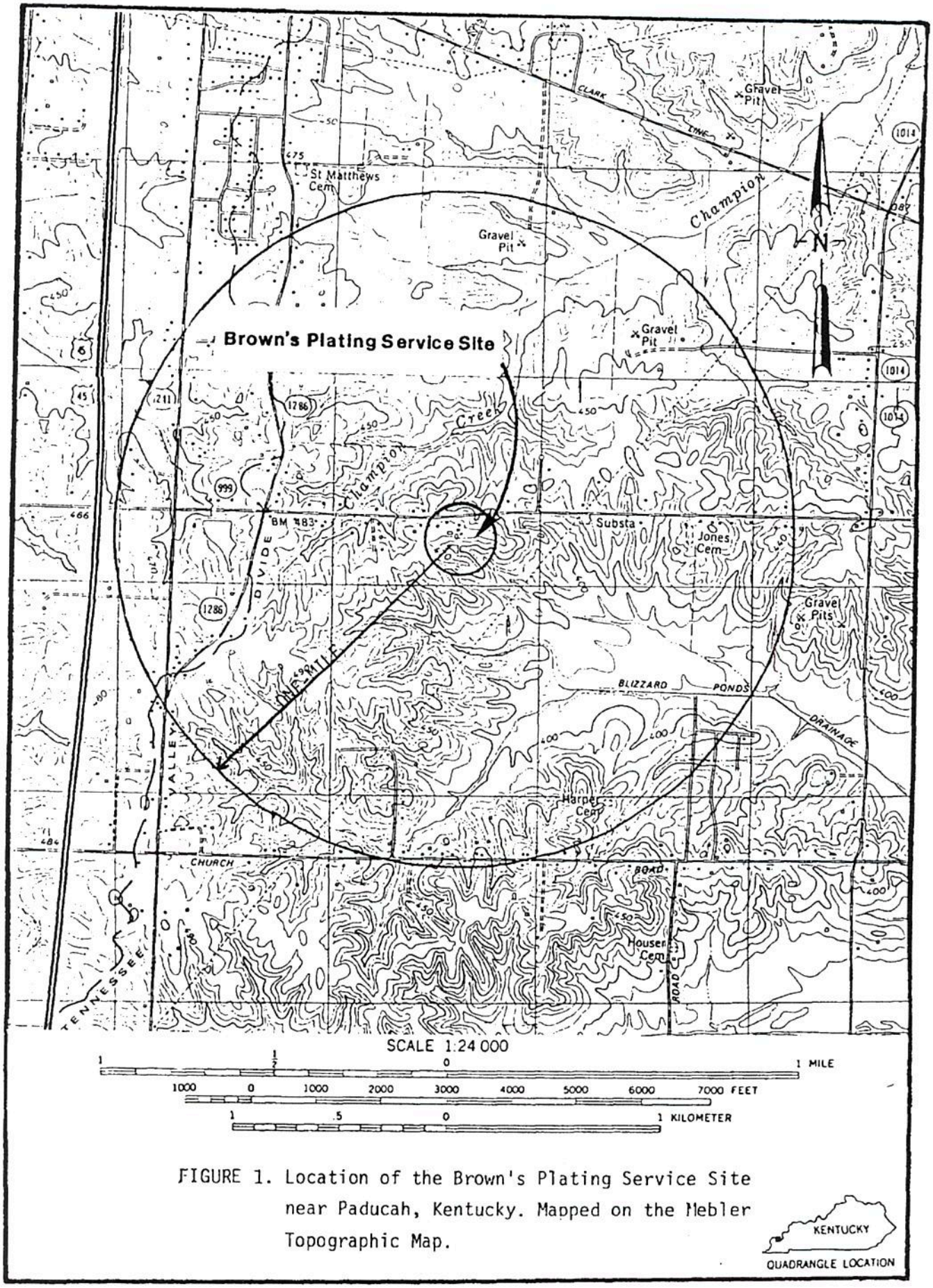


FIGURE 1. Location of the Brown's Plating Service Site near Paducah, Kentucky. Mapped on the Mebler Topographic Map.

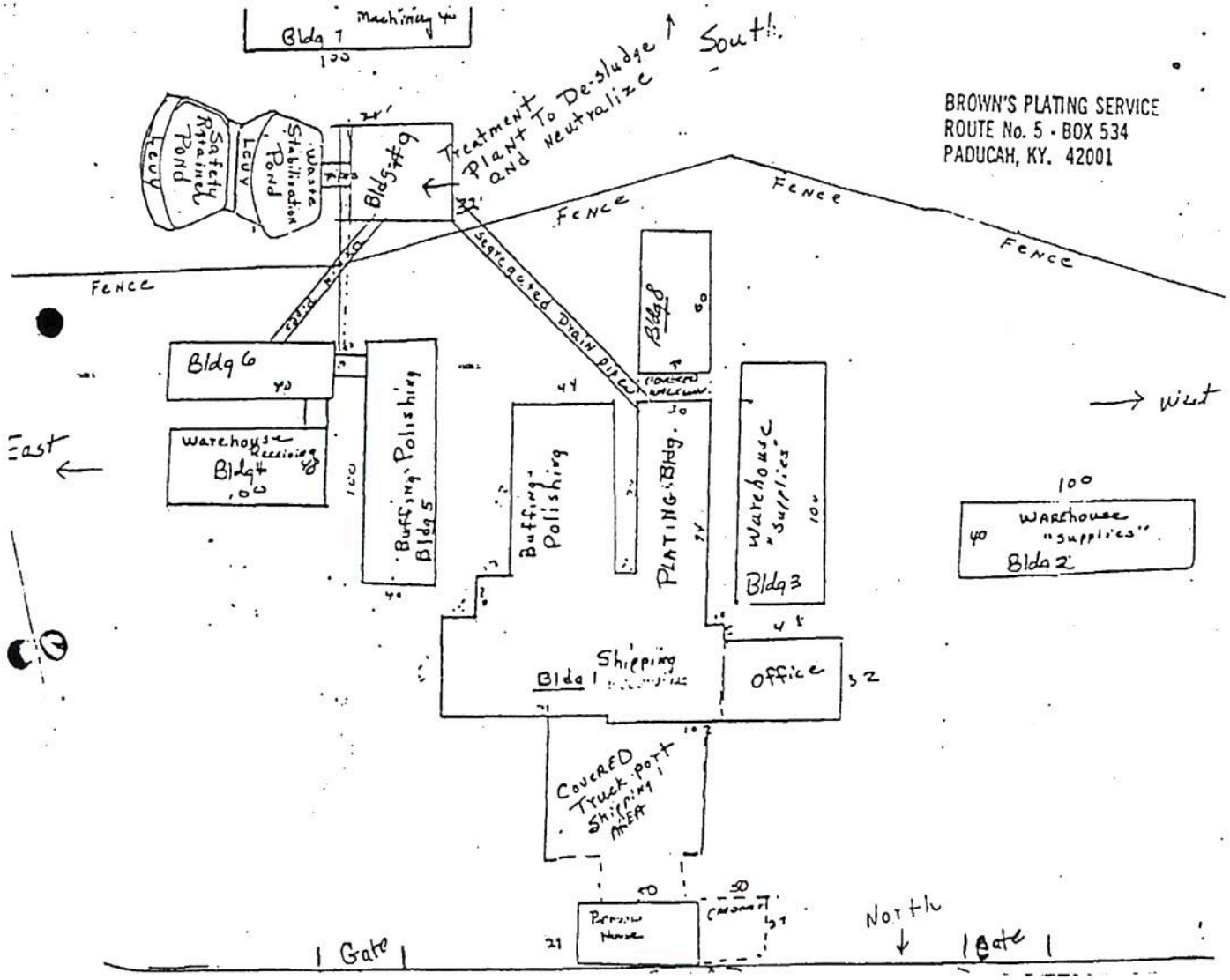


FIGURE 2. SCHEMATIC SITE MAP, BROWNS PLATING SERVICE, PADUCAH, KENTUCKY. (NOT TO SCALE)
SOURCE: PART "A" APPLICATION, 1980

Brown's Plating Service, Inc.
Flow & Process Diagram in GPD

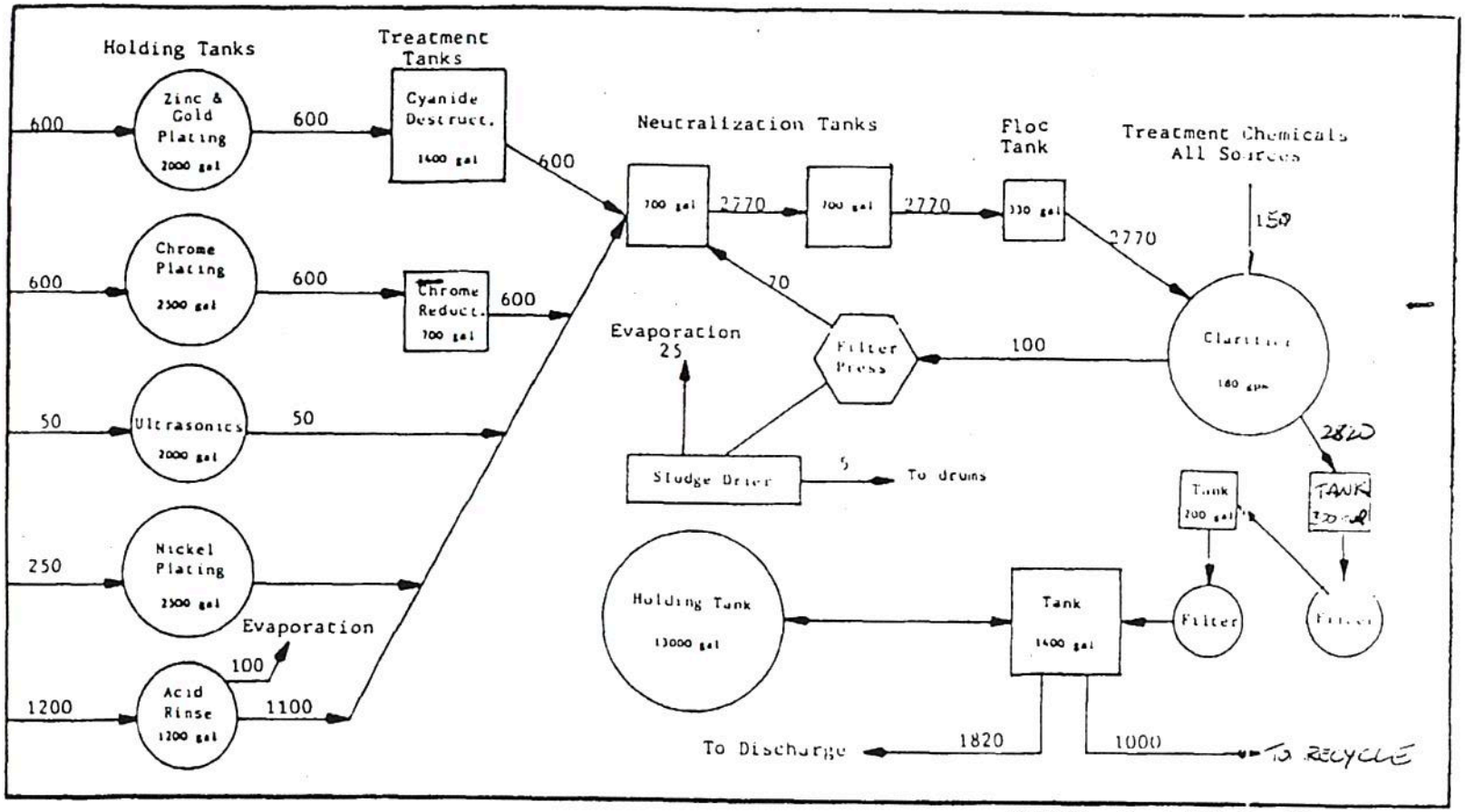
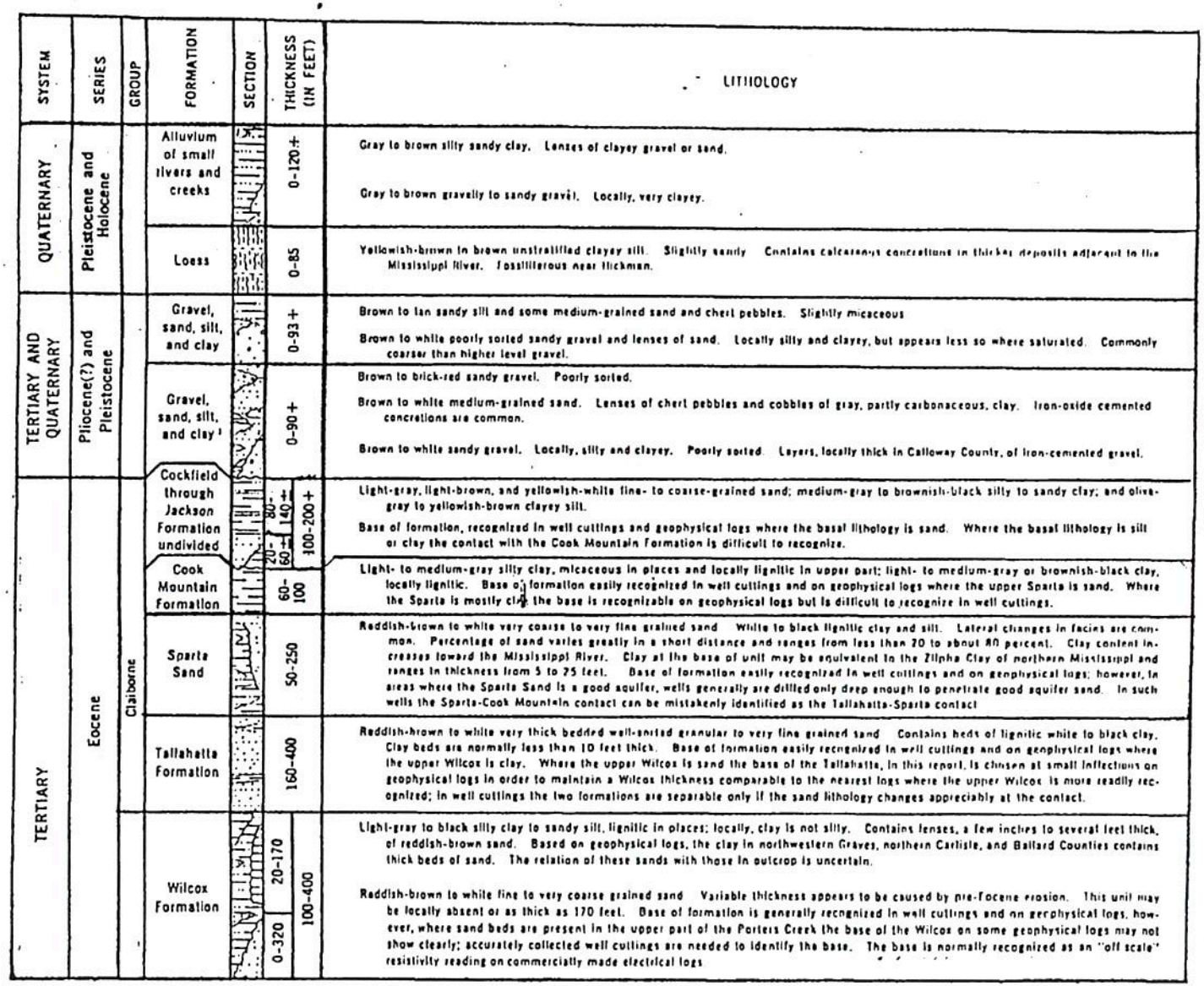


FIGURE 3

SOURCE: Part "A" Application, submitted 1980



SYSTEM	SERIES	GROUP	FORMATION	THICKNESS (IN FEET)	LITHOLOGY
QUATERNARY	Pleistocene and Holocene		Alluvium of small rivers and creeks	0-120+	Gray to brown silty sandy clay. Lenses of clayey gravel or sand. Gray to brown gravelly to sandy gravel. Locally, very clayey.
			Loess	0-85	Yellowish-brown to brown unstratified clayey silt. Slightly sandy. Contains calcareous concretions in thicker deposits adjacent to the Mississippi River. Fossiliferous near Hickman.
TERTIARY AND QUATERNARY	Pliocene(?) and Pleistocene		Gravel, sand, silt, and clay	0-93+	Brown to tan sandy silt and some medium-grained sand and chert pebbles. Slightly micaceous Brown to white poorly sorted sandy gravel and lenses of sand. Locally silty and clayey, but appears less so where saturated. Commonly coarser than higher level gravel.
			Gravel, sand, silt, and clay	0-90+	Brown to brick-red sandy gravel. Poorly sorted. Brown to white medium-grained sand. Lenses of chert pebbles and cobbles of gray, partly carbonaceous, clay. Iron-oxide cemented concretions are common. Brown to white sandy gravel. Locally, silty and clayey. Poorly sorted. Layers, locally thick in Calloway County, of iron-cemented gravel.
TERTIARY	Eocene	Claiborne	Cockfield through Jackson Formation undivided	80-140+ / 20-60+ / 100-200+	Light-gray, light-brown, and yellowish-white fine- to coarse-grained sand; medium-gray to brownish-black silty to sandy clay; and olive-gray to yellowish-brown clayey silt. Base of formation, recognized in well cuttings and geophysical logs where the basal lithology is sand. Where the basal lithology is silt or clay the contact with the Cook Mountain Formation is difficult to recognize.
			Cook Mountain Formation	60-100	Light- to medium-gray silty clay, micaceous in places and locally lignitic in upper part; light- to medium-gray or brownish-black clay, locally lignitic. Base of formation easily recognized in well cuttings and on geophysical logs where the upper Sparta is sand. Where the Sparta is mostly clay the base is recognizable on geophysical logs but is difficult to recognize in well cuttings.
			Sparta Sand	50-250	Reddish-brown to white very coarse to very fine grained sand. White to black lignitic clay and silt. Lateral changes in facies are common. Percentage of sand varies greatly in a short distance and ranges from less than 20 to about 80 percent. Clay content increases toward the Mississippi River. Clay at the base of unit may be equivalent to the Zilpha Clay of northern Mississippi and ranges in thickness from 5 to 75 feet. Base of formation easily recognized in well cuttings and on geophysical logs; however, in areas where the Sparta Sand is a good aquifer, wells generally are drilled only deep enough to penetrate good aquifer sand. In such wells the Sparta-Cook Mountain contact can be mistakenly identified as the Tallahatta-Sparta contact
			Tallahatta Formation	160-400	Reddish-brown to white very thick bedded well-sorted granular to very fine grained sand. Contains beds of lignitic white to black clay. Clay beds are normally less than 10 feet thick. Base of formation easily recognized in well cuttings and on geophysical logs where the upper Wilcox is clay. Where the upper Wilcox is sand the base of the Tallahatta, in this report, is chosen at small inflections on geophysical logs in order to maintain a Wilcox thickness comparable to the nearest logs where the upper Wilcox is more readily recognized; in well cuttings the two formations are separable only if the sand lithology changes appreciably at the contact.
			Wilcox Formation	0-320 / 20-170 / 100-400	Light-gray to black silty clay to sandy silt, lignitic in places; locally, clay is not silty. Contains lenses, a few inches to several feet thick, of reddish-brown sand. Based on geophysical logs, the clay in northwestern Graves, northern Carlisle, and Ballard Counties contains thick beds of sand. The relation of these sands with those in outcrop is uncertain. Reddish-brown to white fine to very coarse grained sand. Variable thickness appears to be caused by pre-Eocene erosion. This unit may be locally absent or as thick as 170 feet. Base of formation is generally recognized in well cuttings and on geophysical logs, however, where sand beds are present in the upper part of the Porters Creek the base of the Wilcox on some geophysical logs may not show clearly; accurately collected well cuttings are needed to identify the base. The base is normally recognized as an "off scale" resistivity reading on commercially made electrical logs

FIGURE 4. Characteristics of Geologic formations underlying the Browns's Plating Service Site, McCracken County, Kentucky.

(Modified from Davis, 1973)

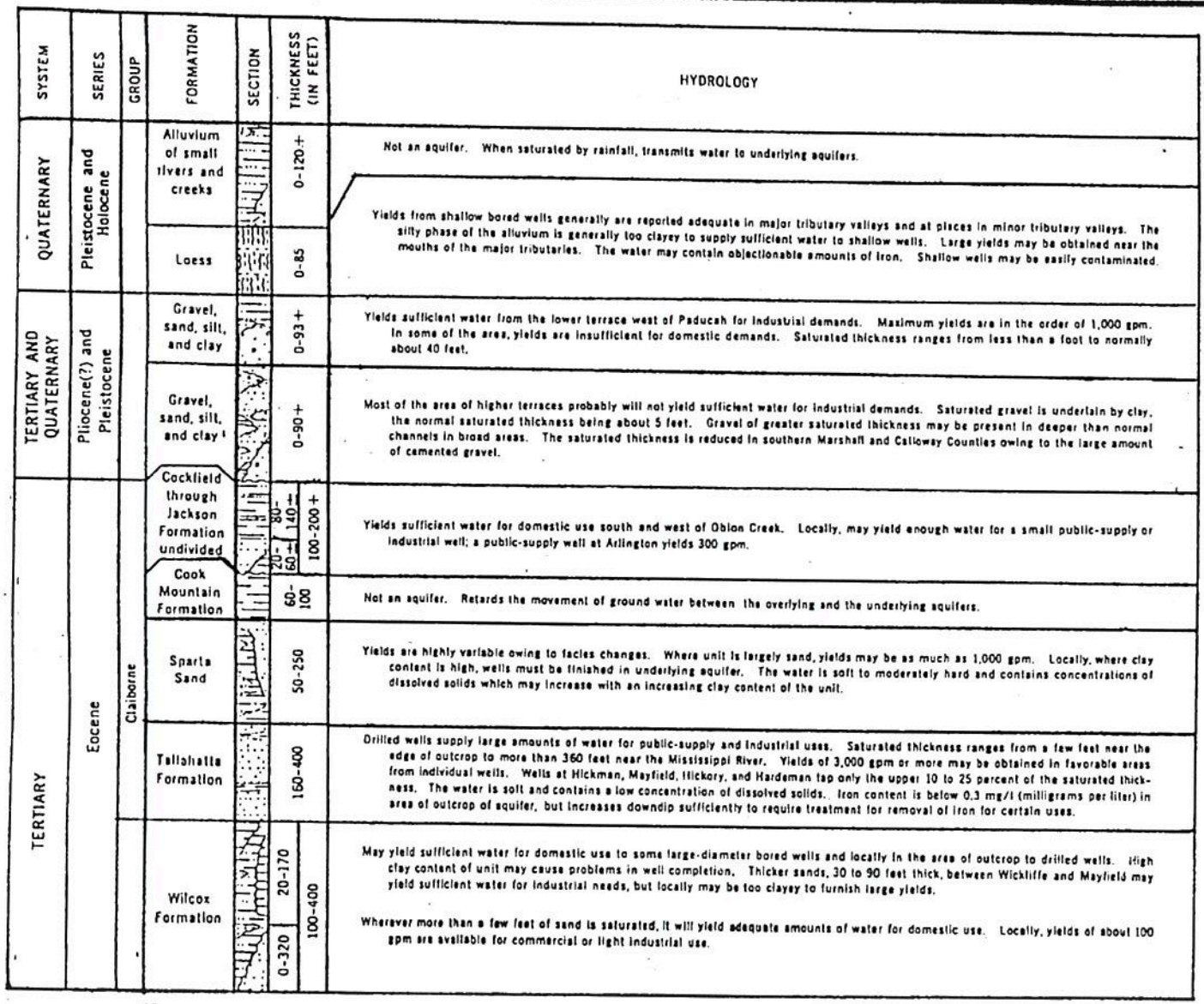


FIGURE 5. Hydrologic characteristics of geologic formations underlying the Brown's Plating Service Site, McCracken County, Kentucky

(Modified from Davis, 1973)